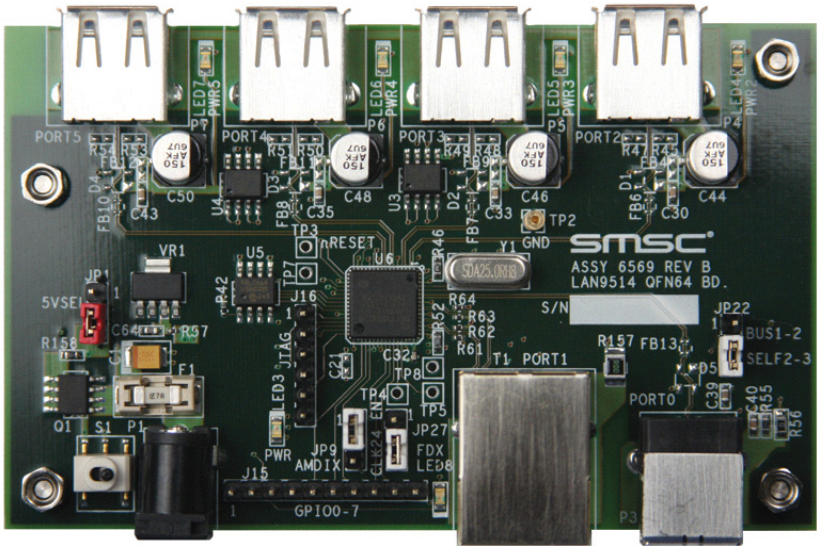
LAN9514 Evaluation Board User Manual



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1 Introduction

The LAN9514 is a high performance, Hi-Speed USB 2.0 hub with a 10/100 Ethernet controller. The LAN9514 contains an integrated USB 2.0 hub, four integrated downstream USB 2.0 PHYs, an integrated upstream USB 2.0 PHY, a 10/100 Ethernet PHY, a 10/100 Ethernet controller, a TAP controller, and an EEPROM controller.

The EVB9514 is an Evaluation Board (EVB) that utilizes the LAN9514 to provide a four port USB 2.0 hub with an integrated 10/100 Ethernet controller. The EVB9514 provides USB connectivity via one type B upstream USB connector and four type A downstream USB connectors. An RJ-45 integrated magnetics Ethernet jack with link/activity LEDs provides 10/100 Ethernet connectivity. The EVB9514 supports both bus-powered and self-powered modes of operation.

The EVB9514 includes a 512x8 Microwire EEPROM that may be used to automatically load USB descriptors, USB device configuration, and the MAC address upon reset. A GPIO header provides access to the LAN9514's general purpose I/O signals. For debugging purposes, the internal LAN9514 TAP controller is accessible via the included JTAG header.

A simplified block diagram of the EVB9514 can be seen in Figure 1.1.

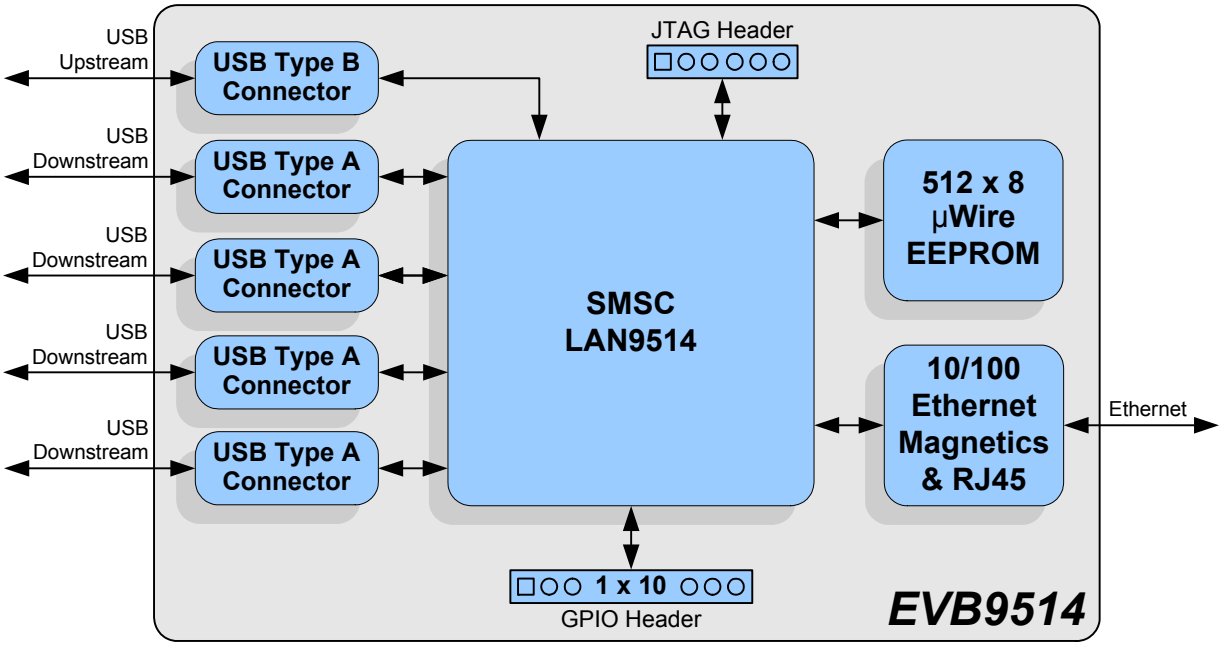


Figure 1.1 EVB9514 Block Diagram

1.1 References

Concepts and material available in the following documents may be helpful when using the EVB9514.

Table 1.1 References

DOCUMENT	LOCATION
SMSC LAN9514 Datasheet	http://www.smsc.com/main/datasheet.html
AN8-13 Suggested Magnetics	http://www.smsc.com/main/appnotes.html
SMSC EVB9514 Evaluation Board Schematic	http://www.smsc.com/

2 Board Details

The following sections describe the various board features, including jumpers, LEDs, test points, system connections, and power. A top view of the EVB9514 is shown in Figure 2.1.

Note: The LAN9514 device is RoHS compliant. However, support components on the EVB9514 board are not necessarily RoHS compliant.

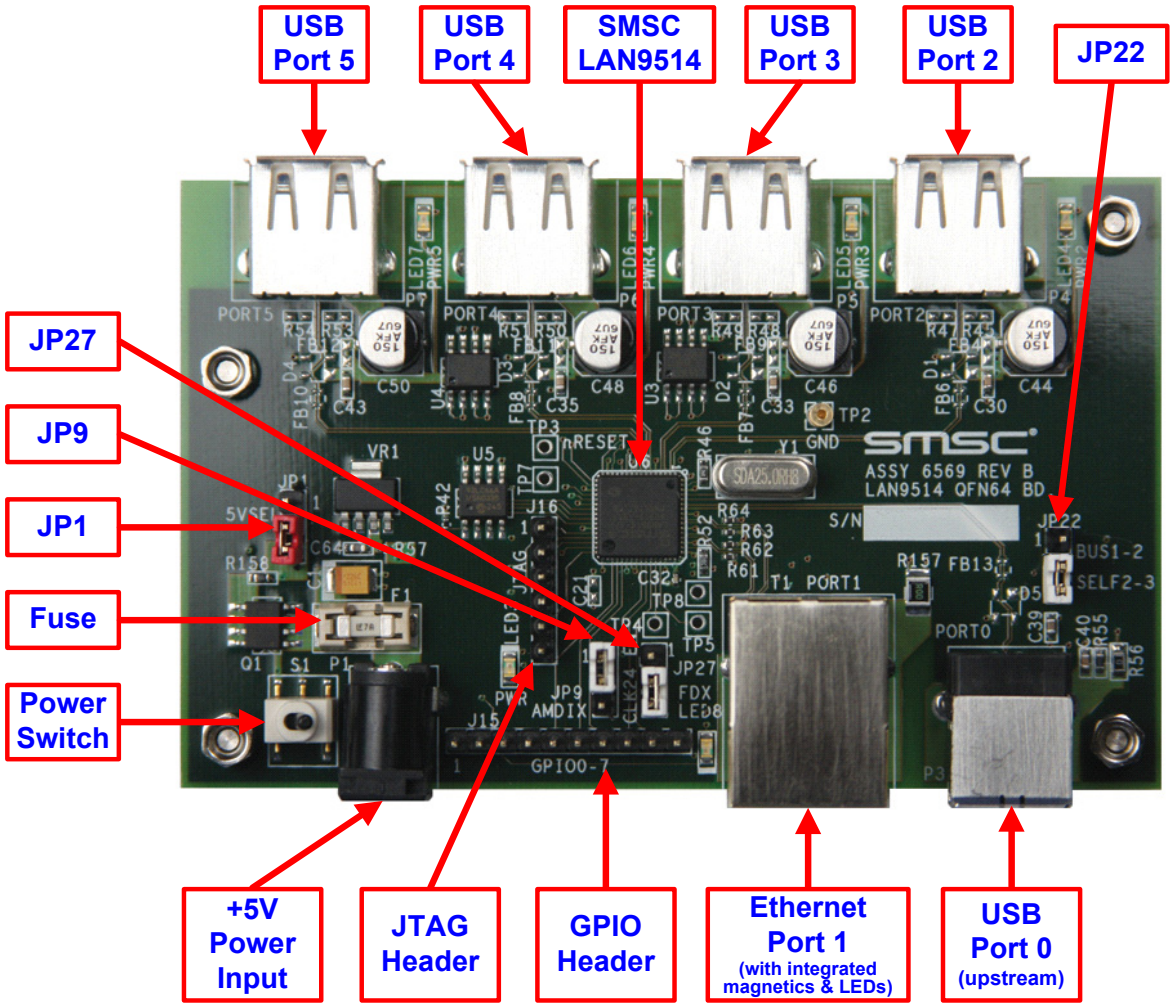


Figure 2.1 EVB9514 Top View

2.1 Jumpers

Table 2.1 describes the default settings and jumper descriptions for the EVB9514. These defaults are the recommended configurations for evaluation of the LAN9514. These settings may be changed as needed, however, any deviation from the default settings should be approached with care and knowledge of the schematics and datasheet. An incorrect jumper setting may disable the board.

Note: A dashed line in the *Settings* column of Table 2.1 indicates the board's default jumper setting.

Table 2.1 Jumpers

JUMPER	DESCRIPTION	SETTINGS	
JP1	5 volt select jumper	1 2	Populate when bus-powered
		2---3	Populate when self-powered (+5V power brick must be attached)
JP9	Auto-MDIX jumper	1---2	Auto-MDIX enabled
		2 3	Auto-MDIX disabled
JP22	VBUS_DET jumper	1 2	Populate when bus-powered
		2---3	Populate when self-powered
JP27	CLK24_EN jumper	1 2	Populate to enable 24MHz CLK24_OUT
		2---3	Populate to disable 24MHz CLK24_OUT

2.2 LEDs

Table 2.2 LEDs

REFERENCE	COLOR	INDICATION
LED3	Green	+3.3V power active
LED4	Green	Power on downstream port 2
LED5	Green	Power on downstream port 3
LED6	Green	Power on downstream port 4
LED7	Green	Power on downstream port 5
LED8	Green	Full duplex on Ethernet port
T1	Green	Link/activity on Ethernet port
T1	Yellow	Speed on Ethernet port

2.3 Test Points

Table 2.3 Test Points

TEST POINT	DESCRIPTION	CONNECTION
TP2	Single pin populated gold post GND testpoint	GND
TP3	Single pin unpopulated nRESET	nRESET
TP4	Single pin unpopulated CLK24_EN	CLK24_EN
TP5	Single pin unpopulated CLK24_OUT	CLK24_OUT
TP7	Single pin unpopulated VDD18CORE	VDD18CORE
TP8	Single pin unpopulated VDD18USBPLL	VDD18USBPLL

2.4 System Connections

Table 2.4 System Connections

PLUG/HEADER	DESCRIPTION	PART
J15	10-pin populated GPIO header	10-pin (1x10) header
J16	6-pin populated JTAG header	6-pin (1x6) header
P1	+5V DC power connector	Barrel plug, 2.0mm, center positive
P3	USB type B right angle - upstream	AMP 292304-1
P4	USB type A right angle - downstream	FCI 87520-0010BLF
P5	USB type A right angle - downstream	FCI 87520-0010BLF
P6	USB type A right angle - downstream	FCI 87520-0010BLF
P7	USB type A right angle - downstream	FCI 87520-0010BLF

2.5 Power

Table 2.5 Power Switch

SWITCH	DESCRIPTION	PART
S1	SPDT tiny toggle power switch	Connects +5V brick power to board

The EVB9514 supports both bus-powered and self-powered modes of operation. The following subsections detail the proper power settings for bus-powered and self-powered operation.

2.5.1 Bus-Powered Operation

For bus-powered operation, the EVB9514 must be configured as follows:

- JP1 must be in the 1-2 position
- JP22 must be in the 1-2 position
- The S1 power switch must be in the open position
- The +5V power brick must be disconnected from the P1 barrel plug

2.5.2 Self-Powered Operation

For self-powered operation, the EVB9514 must be configured as follows:

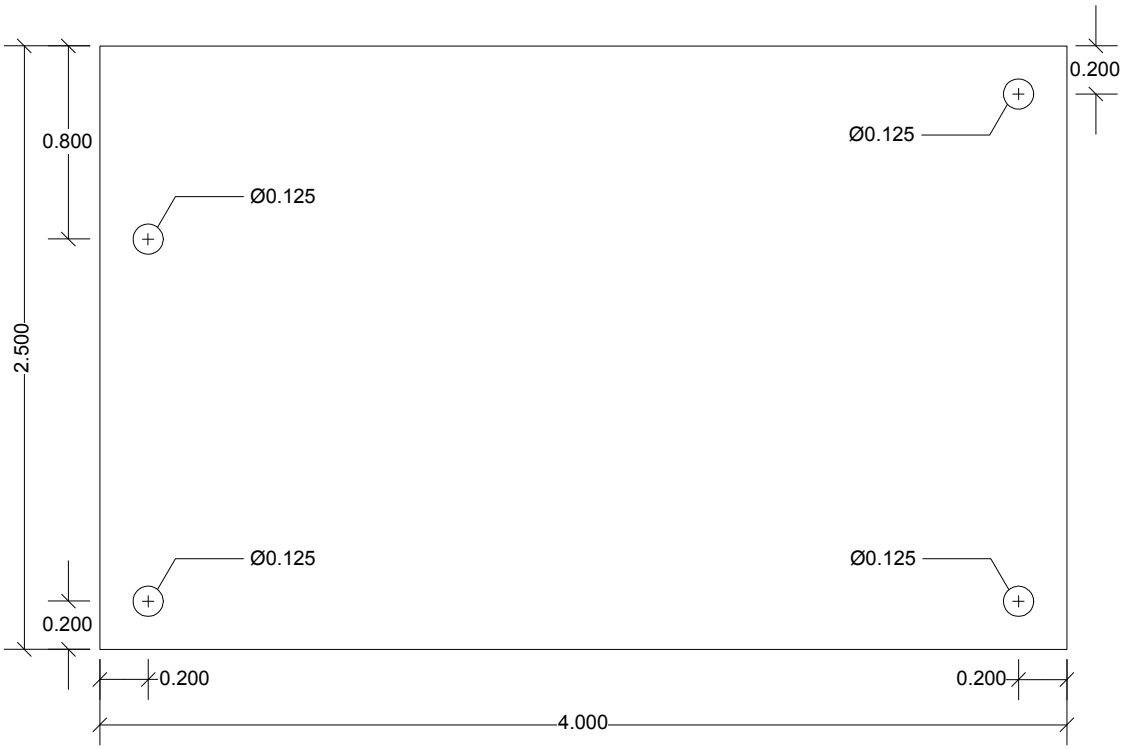
- JP1 must be in the 2-3 position (5V select)
- JP22 must be in the 2-3 position
- The S1 power switch must be in the closed position
- The +5V power brick must be connected to the P1 barrel plug

Note: The EVB9514 includes a 3A fuse (F1) to protect from overcurrent conditions during self-powered operation. If this fuse becomes damaged, it can be replaced with a 3A Littlefuse-154003.

Note: Self-powered operation is the default EVB9514 configuration.

2.6 Mechanicals

Figure 2.2 details the EVB9514 mechanical dimensions and properties.



TOP VIEW

Figure 2.2 EVB9514 Mechanicals

3 Revision History

Table 3.1 Customer Revision History

REVISION LEVEL & DATE	SECTION/FIGURE/ENTRY	CORRECTION
Rev. 1.0 (12-04-12)	Document co-branded: Microchip logo added, modification to legal disclaimer.	
Rev. 1.0 (05-21-09)	Initial Release	

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